** E4104v1**

**Roads Department of the Ministry of Regional Development and Infrastructure of Georgia**

**GEORGIA FOURTH EAST-WEST HIGHWAY IMPROVEMENT PROJECT**

**ENVIRONMENTAL ASSESSMENT**

**EXECUTIVE SUMMARY**

**Environmental Impact Assessment of Works for Upgrading E-60 EWH Section Between**

**Agara East to Didi Sative (km 106 to km 121)**

**JANUARY 2013**

**Fourth East-West Highway Improvement Project**

Environmental Impact Assessment of works for upgrading E-60 EWH section between

Agara East to Didi Sative (km 106 to km 121)[[1]](#footnote-1)

**EXECUTIVE SUMMARY**

**of the Environmental Impact Assessment Report**

**Introduction**

1. Due to its geographical position Georgia has gained the status of an important transport corridor connecting Europe and Asia and the development of the transport infrastructure has become a national priority. The Government of Georgia requested the World Bank to support modernization of the East-West Transport Corridor. Two projects for the improvement of the E-60 East-West Highway have already been completed with the assistance from the World Bank and the Third East-West Highway Improvement project is under implementation. Future investments will complete improvement of the Highway from Ruisi to the already rehabilitated Rikoti tunnel. For this purpose the Government of Georgia asked the World Bank assistance for the preparation and implementation of the Fourth East-West Highway Improvement Project (EWHIP) which covers the section of the highway between Agara West and Gomi bypass (Didi Sative). A Regional Environmental Assessment (REA) and an Environmental Management Framework (EMF) were developed for the entire corridor Sveneti-Ruisi-Rikoti Tunnel.
2. This Environmental Impact Assessment (EIA) has been carried out for Agara West - Gomi bypass (Didi Sative) section of the Highway, including an Environmental Management Plan (EMP). The objective of this EIA is to identify expected environmental impacts and risks of the proposed works, recommend measures for their mitigation, and develop a plan for monitoring environmental compliance during construction and operation of the section of E-60.

**Technical and Environmental Standards and Regulations**

1. Technical design of the highway improvement is in compliance with the Trans-European Motorway (TEM) standards. The project will be implemented in compliance with the Georgian legislation and environmental standards, as well as the World Bank’s safeguard policies. According to the Georgian law, the proposed project requires EIA, conduct of the environmental expertise, and issuance of a permit for impacting the environment. The project triggers World Bank OP/BP 4.01 Environmental Assessment, OP/BP 4.11 Physical Cultural Resources, OP/BP 4.12 Involuntary Resettlement, and OP/BP 4.20 Gender and Development.

**Environmental Screening**

1. The proposed works for the improvement of the E-60 between Agara West and Didi Sative include widening of the existing carriageway for converting it from a two-lane into a four-lane motor road, and construction of a four-lane sections of road on a new alignment bypassing Gomi. Road works of the described scope and scale determine classification of the project as a Category A for environmental assessment purposes, requiring the conduct of a full scale Environmental Impact Assessment (EIA) and development an Environmental Management Plan (EMP).

**Public Participation**

1. The Bank policies and the Georgian legislation require meaningful public participation and involvement in the process of EIA and environmental management planning. The main principles of public consultation include:
* Conduct of at least two public consultation meetings for an environmental Category A
* project at the EIA inception phase and at the stage of mature draft EIA report;
* Disclosure of the draft EIA report to public through the convenient media in a national language;
* Announcement of the venue and time of stakeholder consultation meetings through central and local means of public communication;
* Invitation for written comments/questions on the draft EIA; and
* Incorporation of public feedback into the EIA report and re-disclosure of the finalized document.
1. The initial consultations on the environmental implications of the proposed project and the scope of the forthcoming EIA were carried out at the early stage of its preparation. Meeting with local community was held 25 September 2012. Information about terms of reference, alternatives under consideration, and the EIA procedure and permitting issues were presented.
2. The present draft EIA report was posted on the web page of the Roads Department (RD) of the Ministry of Regional Development and Infrastructure of Georgia. Hard copies of the document will be made available at the offices of Gomi and Khashuri local self governments located within the project implementation area. RD will organize public consultation meeting to discuss the draft EIA report within 50 days from disclosure. Information about the date and time of the meeting will be published in the local and the national coverage newspapers. The report will be finalized with incorporation of the feedback received from the stakeholders through the consultation period.

**Sensitive Environmental Receptors and Potential Impacts**

1. The Agara West-Didi Sative section passes through the significantly transformed landscape, away from protected areas and biodiversity hotspots. The main environmental impacts are expected at the construction phase and come from clearing of the right-of-way (RoW); establishment/ operation of work camps and temporary access roads; operation/servicing of construction machinery; earth works; works in river crossing/close to the riverbed (Suramula and Mtkvari rivers) and construction of bank protection structure along the left bank of the Mtkvari River.
2. Clearing of the RoW will be required for widening of road in the sections where the highway alignment remains unchanged, and for cleaning a new route for the re-aligned sections. This would imply removal and stockpiling of topsoil, removal of shrubs, and cutting of up to 1490 trees and shrubs. Establishment of construction camps and access roads is associated with generation of solid waste and waste water, compression of soil, and noise disturbance for nearby population. Parking, operating and servicing of construction machinery will carry the risk of operational spills of oils and lubricants (i.e. the risk of soil and water pollution) and generation of noise, vibration, dust, and emissions. Construction of bridges and the bank protection structure can cause water pollution with liquid/solid waste. Increase of water turbidity, as a consequence carries risk of temporary impact on aquatic life. It is expected that the construction material will be purchased from suppliers licenced to operate quarries. License for use of natural resources – in case contractor decides to use own quarries - will be obtained by contractor from the Ministry of Energy and Natural Resources. Construction works will also have implications for the occupational health and safety of workers/personnel.
3. Impacts of the upgraded section of the road during its operation phase are less diverse. Considerable environmental aspects of the highway operation will be air pollution from automobile emissions, noise, and pollution of soil and surface water with litter and drainage from the highway as well as water pollution with liquid/powder cargo and/or fuel and lubricants from the cars as a result of traffic accidents on the road section passing near riverside and/or the accidents on the river crossings. Project design brings risks of negative impacts on rivers’ hydrology from the highway operation to the feasible minimum. Provision for road safety and control over the traffic regulation will contribute to managing risks of accidents on the bridge and near the river bank. Acceptable noise levels will not be exceeded in the short to medium term perspective and are likely only in case of traffic increase projected in a long term. The design allows for placing sound barriers in the future if needed. Finally, traffic safety will be an important issue with health, social, and environmental implications.

**Project Alternatives**

1. Various alignments of the highway carry different levels of environmental risks, which has been critical in environmental analysis of project alternatives.
2. No “showstoppers” have been identified during EIA and the anticipated impacts can be managed by application of adequate construction standards and good environmental practices. Nonetheless, a “do nothing” option was considered as one of the project alternatives. While it has no environmental and social impacts resulting from construction works, operating the highway in its current poor condition has negative environmental impacts from traffic jams, noise, low speed, and high emission. In the future with consideration of increase traffic flow, the situation will worsen. Under the "do nothing" scenario local communities would lose opportunity of benefiting from all positive effects associated with the highway improvement, including profits resulting from increased cargo turnover and tourism. Therefore, as the potential positive impacts of the project surpass its possible negative impacts, the “do nothing” option was discarded.
3. Out of the five considered alternative alignments considered at the feasibility stage three were discarded at an earlier stage due to the anticipated significant negative impacts, including alteration of land use patterns and major resettlement/compensation needs. Preferred alternative – widening of the road within the present alignment in one section and re-alignment of the road to bypass Gomi was analysed in depth.

**Project Description**

1. The project will support expansion of the existing two-lane road into a four-lane road, as well as construction of four-lane sections on a new alignment where re-routing is necessary. In the first section widening of road within the present right of way will occur. The new section will bypass Gomi and near vil.Agarebi (km26.00) continue north-westward bypassing vil.Kvemo Osiauri up to km 31. The length of Gomi bypass section of the E-60 Highway is 12 km. The new alignment will run in proximity to the Mtkvari riverbed. Minimum distance of the road from the river is 51 m, which means that the boundaries of protection zone for the Mtkvari (50m) are not violated. The project includes building of one two-layer overpass to Gomi; two underpasses; railway overpass and a 35 m long bridge over Suramula river; seven cattle crossings, fifteen reinforces concrete culverts, drainage ditches equipped with water wells and stone filters along the road (including bridge) to divert runoff from the carriageway as well as 3.8km long riprap structure along the Mtkvari river, most of which is not in contact with water and is designed mainly to provide additional protection of the new alignment.
2. A central reservation will separate two pairs of highway lanes. Paved shoulders will be provided for breakdown and emergency use. Surface water drains, safety barriers, lighting and signage will be arranged for safe operation of the upgraded section of the highway. Following the TEM Standard, each width of each lane will be 3.75 m; shoulders - 3.75 m; paved berm - 3.00 m; unpaved berm - 0.75 m; and the central reservation - 5.00 m (including safety barriers). The total width of the road will make 27.50 m. For highway sections to be upgraded without re-alignment, the existing carriageway will be repaired, and a new two-lane carriageway will be built alongside.
3. Based on experience gained from other similar road projects it can be assumed that construction may involve a total workforce of about 200. Out of these 60% to 70 % may be local workforce, which could be hired as semi-skilled or unskilled workers during the construction period.
4. Land acquisition issues are being studied by the consulting firm Eptisa. The survey is not finished yet. Relevant information will be included in the final version of the EIA.

**Environmental Impact Assessment Methodology**

1. The EIA of Gomi bypass section of the highway is comprised of (i) determination of the scope of the work; (ii) collection of the detailed baseline data; (iii) assessment of expected impacts; (iv)outlining of mitigation measures; and (v) development of environmental management and monitoring plans.
2. The EIA process was a combination of desk work and field work, comprising of literature review, data collection from various agencies, visual observation (flora and fauna survey) and fact finding along the RoW, noise and air modelling and analysis of all collected information. Results of engineering-geological and topographic survey, technical information related to design of the bank protection structure, bridge and other components of the project were considered. Impacts of the project activities to be implemented outside the RoW - such as construction camps, temporary access roads, etc. - have been fully considered as well. On initial stage of the EIA, spatial boundaries of the study area were defined to allow identification and assessment of the expected impacts and to enable comparative assessment of project alternatives in a given environment.

**Environmental Baseline**

1. The EIA report presents information about the physical, biological, and socio-economic characteristics of the environment alongside the project alignment. The purpose of this description is to establish environmental baseline, to identify potential sensitivities, and to suggest adequate response through measures that are appropriate to avoid, minimize, or mitigate potential adverse impacts.
2. The 12 km section of the highway to be upgraded under the proposed project passes through rural areas, where environmental pollution is insignificant. No polluting or noise-intensive industries exist in the region nowadays. Physical environment around the subject section of the highway is not rich in its biodiversity. Landscape around it is mostly altered and land is either cultivated or degraded. There are no designated protected areas in the vicinity of the project site. No protected plant or fauna species are either recorded from the area or registered during field surveys. Rivers and adjacent floodplains are the only types of sensitive habitats, which fall under potential direct impact zone of the project during the construction phase.
3. The baseline studies included the following components:
* Climate and meteorology;
* Geology, geomorphology;
* Hydrology, hydrogeology;
* Soils, landscape and land use;
* Air quality;
* Noise;
* Seismic conditions and hazardous processes;
* Flora and fauna; and
* Historical, archaeological sites and
* Human environment.

1. According to the environmental baseline data, the highest environmental sensitivity of the proposed project is proximity of a part of the designed re-alignment to the river. Associated risks of the construction phase include impact on vegetation and soil, possible deterioration of water quality and disturbance of terrestrial and aquatic life, while risks of the operation phase are potential water damage to the road embankment and increased flooding of the area on the right bank of the river in the section where embankment will be built on the left bank. These risks were carefully examined from engineering and environmental viewpoints and were found moderate. Construction phase impacts may be mitigated by applying conventional good practice of works in waterways as described below.
2. Research of the social baseline revealed a single most sensitive human aspect of the project implementation, which is the required land take. Livelihoods of the majority of affected households considerably depend on the land plots and small businesses the ownership and use of which will be altered in the course of the project implementation. This finding emphasizes the importance of diligent planning and timely provision of adequate compensation and restoration of livelihoods to be conducted under the frames of the Resettlement Policy Framework developed for the project.

**Expected Impacts and Mitigation**

1. The results of the EIA show that majority of the potential environmental impacts of the project are associated with the construction phase and are temporary in nature. The main approach of the EIA was to provide adequate recommendations for the prevention or mitigation of negative environmental impacts of the project. These recommendations are applicable during road design, construction, and operation phases. Taking into account the location and sensitivity of human settlements and environmental receptors, the following mitigation measures were developed for mitigating the main risks associated with the project implementation:
* Impact on vegetative cover: Clearing of the right of way, especially in the re-aligned parts of the highway, will imply removal of vegetation, including cutting of trees. Loss of vegetation will be kept at the possible minimum. The trees removed from the State owned areas will be compensated through re-planting along the right of way at a ratio of 1:3, and those cleared from private land plots will be compensated in accordance with the Resettlement Action Plan. Selection of species for planting will be based on the natural composition of local flora. Greening of the construction sites along the right of way, as well as maintenance of the re-planted areas for a year will be included in the assignment of a works contractor. RD will be responsible for further maintenance of plantations.
* Disturbance of local communities: Movement of construction machinery, location of the temporary work camps, and temporary storage of construction materials and waste will be planned to avoid or minimize barriers for free movement of the local population. Deterioration of the air quality near populated areas will be controlled through oversight on the technical condition of construction machinery. Operation of engines in idle regime will be discouraged. Operation of construction machinery will be limited to the regular working hours.
* Operation of work camps and access roads: Work camps and temporary access roads will be located preferably in the already transformed areas to minimize landscape and ecosystem degradation. The camps will be organized to have designated areas for storage of materials and waste, and will be equipped with septic tanks. Areas designated for fuelling/servicing of machinery and for storing of hazardous substances will be provided with ground lining and barriers preventing release of spillage. After completion of works contractor will be obliged to remove all temporary facilities from the site and restore the area to the original state to the extent possible under the circumstances.
* Air pollution: Air pollution can appear during earthworks, gravel crashing, concrete mixing, and transportation in case of improper maintenance and operation of equipment, inadequate storage of fine-grained materials, and movement of vehicles on unpaved or dusty surfaces. To reduce generation of dust and reduce emissions, construction equipment will be maintained in good working condition and mixing equipment will be sealed. Concrete mixing plants will be installed at least 300 m away from settlements windward. Speed limits will be set for construction vehicles and all loose material will be covered with tarpaulins when transported off-site with trucks. A wheel-washing facility will be provided and ensured that it is used by all vehicles before leaving all sites. All unpaved roads and significant areas of uncovered soil will be sprinkled during working hours in dry weather conditions.
* Operation of construction machinery: The technical condition of the construction machinery will be checked on regular basis to minimize air pollution from exhausts oil and soil/water pollution from leakage of fuel. The risk of operational and emergency spills of fuel and lubricants will be mitigated by designation of special parking and servicing sites, to be located away from waterways and other sensitive environmental receptors. The sites will be equipped with wastewater/spill capturing and treatment facilities.
* Earth works: Prior to excavation, top soil will be removed and stored separately for later reinstatement of the area. Landscape restoration will be carried out to ensure stabilization of slopes. This would include seeding of grass and planting trees.
* Construction of bridge and bank protection structure: Works in the waterways will be planned to avoid construction during fish spawning periods (June-September). River banks will be checked for stability in the course of works and reinforced as necessary to minimize erosion. Barriers of inert materials will be used to avoid sedimentation from terraced sides of river beds. Working time will be minimized during filling the bridge footings with concrete. If temporary re-direction of river stream becomes necessary, piping, channels, and fish-passes will be arranged to allow alternative water flow and fish movement. Technical condition of machinery operated in and near waterways will be checked on daily basis to avoid leakage and operational spills of fuel and lubricants. No stockpiling of construction materials and waste will be allowed in or nearby the waterways. According to the design drainage ditches will carry filters arranged on the both sides of the carriageway (including bridge) enabling to avoid surface water pollution with runoff from the road or pollution of water in case of road accidents. Bank protection structure is a riprap built mostly on shore with minimum contact with the stream.
* Accumulation of construction waste: Temporary storage of waste will be organized by separating construction debris, household solid waste, and hazardous waste. The latter, comprising of used filters, tires, and lubricants from machinery, will be kept in a closed and isolated storage. Out transportation of waste from the construction sites will follow a time- bound schedule. Formal instructions will be obtained from local authorities for the final disposal of waste in the existing landfills. Access material, such as soil and rock, may be disposed outside municipal landfills if authorised by local authorities, as permitted by national legislation, and in compliance with conventional good environmental practice. Volumes of disposable waste will be minimized to the extent possible through re-cycling/reuse and back-filling of material as feasible.
* Operation of quarries and borrow pits: Purchase of inert construction materials will be allowed only from the licensed legal and/or physical bodies. Extraction of these materials will also be allowed on the grounds of a special license. Opening of new borrow pits will be avoided if those already in operation can be used instead. Operation of quarries and borrow pits, as well as extraction of gravel from river terraces, will be carried out strictly in accordance with the conditions of a license issued by the State authority and enforced by the Ministry of Energy and Natural Resources.
* Historical, cultural, and archaeological sites: All known historical and cultural monuments along the right of way were identified and mapped during the EIA. The Highway alignment will not cause physical damage to these monuments. There is a high likelihood of chance finds during earth works, though. Supervision of works by an archaeologist is recommended. If an artefact is encountered by a works contractor, all activities on site will be immediately taken on hold and State authorities responsible for the protection of cultural heritage will be urgently notified. Works will resume only upon receipt of written communication from the cultural heritage protection authorities.
* Occupational health and safety: Work camps will be established and operated to ensure the maintenance of adequate hygiene and sanitation. Workers and other personnel involved in the project will be provided with personal protection equipment and gear. They will receive training on the safety rules and course of action in case of emergencies. Special safety regulations will be provided and conformed during works in waterways.

**Environmental Management Plan**

1. This EIA report contains the EMP with a full set of the proposed mitigation measures, as summarized above, and monitoring indicators. It also describes the role of RD in overseeing adherence of construction works with the recommended mitigation measures and identifies the needs for RD’s technical and institutional capacity building for ensuring full environmental compliance of the project. A supervision consultant will be hired by RD to provide technical control and quality assurance of civil works. Environmental monitoring will be an integral part of the consultant’s assignment and information on the compliance with EMP will be included into the supervisor’s regular reporting to the RD. RD will have an overall responsibility for applying due environmental diligence. This will include ensuring quality of the supervision consultant’s performance, site inspections, timely response to any issues identified by the consultant or by RD inspectors, and record keeping on all environmental aspects of the project implementation.
2. Before commencement of works the selected works contractor will be asked to develop and agree with the RD and the World Bank waste management (including spoil disposal), traffic management, health and safety and other plans listed in technical specification for tenderers. The works contractor will also develop and agree with the client a plan of greening and landscape reinstatement at a relevant stage of contract implementation.

**Operation of the Highway**

1. The improvement of the E-60 highway aims at minimizing the need of interventions during its operation and maintenance. Ensuring safe and good environmental performance will be a high priority at the operations stage and will comply with the requirements of the national legislation and the best international practices. RD, through an outsourcing arrangement, will permanently maintain and, in a longer term, improve greening along the right of way to be provided by the construction contractor for landscape reinstatement and as a compensation for trees removed during works. Regular collection of solid waste will be organized along highway. The State technical control of the highway through regular oversight and inspection will be provided.
2. Bank protection structure will not change hydrology of the stream or cause flooding of the land on the right bank of the river. Based on modelling done, operation of the upgraded Gomi bypass section of the highway is unlikely to cause increase of noise levels beyond the established acceptable levels in short to medium term perspective, and therefore no mitigation measures are required at present. In case the noise level limits are exceeded in future due to increase of traffic volumes forecasted in a long term perspective, RD will install noise barriers and consider additional greening along the rights of way.
1. Ruisi-Rikoti section of the EW-60 Highway has been broken down into three segments for rehabilitation. According to the ToR these were: Ruisi-Agara (km 95 - km106); Agara East-Didi Sative (km 106 - km121) and Didi Sative-Rikoti Tunnel (km 121-km143). On the design stage the mentioned division has been revised. The first section was extended to include Agara bypass. This caused some changes in the chainage of subsequent section of the road. According to the new division the chainage of Agara East - Didi Sative changed from km 106-121 to km 114 - km 126. Therefore hereinafter the section is referred to as Agara West - Didi Sative. [↑](#footnote-ref-1)